Amendments to the Claims:

The following Listing of Claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Original) A Schottky diode comprising:

a polycrystalline organic semiconductor layer;

a rectifying contact on a first surface of the organic semiconductor layer;

a doped buffer layer in contact with a second surface of the organic semiconductor layer, the doped buffer layer formed of an amorphous doped organic semiconductor; and

an ohmic contact to the doped buffer layer.

2. (Original) The Schottky diode of claim 1 wherein the organic semiconductor layer is a π-conjugated polymer.

3. (Original) The Schottky diode of claim 1 wherein the organic semiconductor layer is chosen from a group consisting of pentacene, metal-free phthalocyanine, fullerene doped with indium or antimony, polyaniline, polypyrrole, poly(p-phenylene), poly(p-phenylenevinylene), a substituted pentacene compound, a bis(2-acenyl)acetylene compound, an acene-thiophene compound, $F_{16}CuPc$, $F_{16}ZnPc$, $F_{16}FePc$, $F_{16}CoPc$ and N,N'-dioctyl-3,4,9,10-perylene tetracarboxylic diimide.

4. (Original) The Schottky diode of claim 1 wherein the amorphous organic semiconductor has a thickness between 1500 and 10,000 angstroms.

5. (Original) The Schottky diode of claim 4 wherein the amorphous organic semiconductor has a thickness between 3000 and 3500 angstroms.

6. (Original) The Schottky diode of claim 1 wherein the amorphous organic semiconductor is MTDATA.

7. (Original) The Schottky diode of claim 6 wherein the MTDATA is doped with F_4-TCNQ.

8. (Original) The Schottky diode of claim 7 wherein the MTDATA is doped with 3-20% F_4-TCNQ.

9. (Original) The Schottky diode of claim 8 wherein the MTDATA is doped with 5-10% F_4-TCNQ.

10. (Original) A Schottky diode comprising:

a substrate;

an ohmic contact with a first surface in contact with a first surface of the substrate;

a doped buffer layer with a first surface in contact with a second surface of the ohmic contact, the doped buffer layer formed of an amorphous doped organic semiconductor;

a polycrystalline organic semiconductor layer with a first surface in contact with a second surface of the doped buffer layer; and

a rectifying contact with a first surface in contact with a second surface of the organic semiconductor layer.

11. (Original) The Schottky diode of claim 10 wherein the organic semiconductor layer is a π-conjugated polymer.

12. (Original) The Schottky diode of claim 10 wherein the organic semiconductor layer is chosen from a group consisting of pentacene, metal-free phthalocyanine, fullerene doped with indium or antimony, polyaniline, polypyrrole, poly(p-phenylene), poly(p-phenylenevinylene), a substituted pentacene compound, a bis(2-acenyl)acetylene compound, an acene-thiophene

compound, $F_{16}CuPc$, $F_{16}ZnPc$, $F_{16}FePc$, $F_{16}CoPc$ and N,N'-dioctyl-3,4,9,10-perylene tetracarboxylic diimide.

13. (Original) The Schottky diode of claim 10 wherein the amorphous organic semiconductor has a thickness between 1500 and 10,000 angstroms.

14. (Original) The Schottky diode of claim 13 wherein the amorphous organic semiconductor has a thickness between 3000 and 3500 angstroms.

15. (Original) The Schottky diode of claim 10 wherein the amorphous semiconductor is MTDATA.

16. (Original) The Scottky diode of claim 15 wherein the MTDATA is doped with F_4-TCNQ.

17. (Original) The Schottky diode of claim 16 wherein the MTDATA is doped with 3-20% F_4-TCNQ.

18. (Original) The Schottky diode of claim 17 wherein the MTDATA is doped with 5-10% F_4-TCNQ.

19. (Withdrawn) A Schottky diode comprising:

a substrate;

a rectifying contact with a first surface in contact with a first surface of the substrate;

a polycrystalline organic semiconductor layer with a first surface in contact with a second surface of the rectifying contact;

a doped buffer layer with a first surface in contact with a second surface of the polycrystalline organic semiconductor layer, the doped buffer layer formed of an amorphous doped organic semiconductor; and

an ohmic contact with a first surface in contact with a second surface of the doped buffer layer.

20. (Withdrawn) The Schottky diode of claim 19 wherein the organic semiconductor layer is a π-conjugated polymer.

21. (Withdrawn) The Schottky diode of claim 19 wherein the organic semiconductor layer is chosen from a group consisting of pentacene, metal-free phthalocyanine, fullerene doped with indium or antimony, polyaniline, polypyrrole, poly(p-phenylene), poly(p-phenylenevinylene), a substituted pentacene compound, a bis(2-acenyl)acetylene compound, an acene-thiophene compound, $F_{16}CuPc$, $F_{16}ZnPc$, $F_{16}FePc$, $F_{16}CoPc$ and N,N'-dioctyl-3,4,9,10-perylene tetracarboxylic diimide.

22. (Withdrawn) The Schottky diode of claim 19 wherein the amorphous organic semiconductor has a thickness between 1500 and 10,000 angstroms.

23. (Withdrawn) The Schottky diode of claim 22 wherein the amorphous organic semiconductor has a thickness between 3000 and 3500 angstroms.

24. (Withdrawn) The Schottky diode of claim 19 wherein the amorphous organic semiconductor is MTDATA.

25. (Withdrawn) The Schottky diode of claim 24 wherein the MTDATA is doped with F_4-TCNQ.

26. (Withdrawn) The Schottky diode of claim 25 wherein the MTDATA is doped with 3-20% F_4-TCNQ.

27. (Withdrawn) The Schottky diode of claim 26 wherein the MTDATA is doped with 5-10% F_4-TCNQ.